

CLAIMS

1. An electromechanical filter comprising:

a conductor acting as a signal line;

5 a magnetic field generating portion for generating a magnetic field passing through the conductor; and

a drive electrode for changing the magnetic field passing through the signal line by displacing relative positions of the conductor and the magnetic field generating portion.

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2. The electromechanical filter according to claim 1,

wherein the conductor is an electrode that is arranged to oppose to the drive electrode and is displaced by an electrostatic force generated between the drive electrode and
15 the conductor.

3. The electromechanical filter according to claim 1 or 2,

wherein the magnetic field generating portion includes a magnetic material that is formed to be displaced.

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4. The electromechanical filter according to claim 3,

wherein the magnetic material that is displaced by an electrostatic force of the drive electrode.

25 5. The electromechanical filter according to any one of

claims 1 to 4,

wherein the drive electrode is movable.

6. The electromechanical filter according to claim 2,
5 further comprising:

a drive electrode formed on a substrate surface and
constructed to vary a potential;

a conductor pattern arranged on the drive electrode to
oppose thereto at a predetermined interval to constitute the
10 signal line; and

a magnetic field generating portion comprising a
magnetic material film pattern that is magnetized to have a
magnetic filed component that intersects orthogonally with the
signal line,

15 wherein the signal line is displaced by changing a
potential of the drive electrode, and a ferromagnetic resonance
frequency is changed by changing the magnetic field generated
by the magnetic material film pattern on the signal line.

20 7. The electromechanical filter according to claim 2,
further comprising:

a magnetic field generating portion formed of a magnetic
material film pattern formed on a substrate surface;

a conductor pattern arranged movably on the magnetic material
25 film pattern to oppose thereto at a predetermined interval to

constitute the signal line; and

a drive electrode arranged in close vicinity to the signal line,

wherein the magnetic material film pattern is magnetized to have a magnetic field component that intersects orthogonally with the signal line, and

wherein the signal line is displaced by changing a potential of the drive electrode, and a ferromagnetic resonance frequency is changed by changing the magnetic field generated by the magnetic material film pattern on the signal line.

8. The electromechanical filter according to claim 6 or 7, wherein the magnetic material film pattern is formed on an insulating film that covers a semiconductor substrate surface, and

wherein the signal line constitutes a fixed beam that is arranged to oppose to the magnetic material film pattern.

9. The electromechanical filter according to claim 6 or 7, wherein the signal line is arranged in parallel with the drive electrode, and

wherein the magnetic material film pattern generates a magnetic field in a direction that intersects orthogonally with the signal passing through the conductor pattern.

10. The electromechanical filter according to any one of claims 6 to 9,

wherein the drive electrode includes first and second conductor film patterns arranged to put the signal line therebetween.

11. The electromechanical filter according to claim 4 or 5, further comprising:

a magnetic field generating portion formed of a magnetic material film pattern that is formed on a substrate surface movably in a space;

a conductor pattern fixed/arranged onto the substrate to oppose to the magnetic material film pattern at a predetermined interval and to constitute the signal line; and

a drive electrode arranged in close vicinity to the magnetic field generating portion to displace the magnetic field generating portion,

wherein the magnetic material film pattern is magnetized to have a magnetic field component that intersects orthogonally with the signal line,

wherein the signal line is displaced by changing a potential of the drive electrode, and

wherein a ferromagnetic resonance frequency is changed by changing the magnetic field generated by the magnetic material film pattern on the signal line.

12. The electromechanical filter according to claim 11,
wherein the magnetic material film pattern constitutes
a beam member that is formed via a spacer formed on a
5 semiconductor substrate surface.

13. The electromechanical filter according to claim 12,
wherein the signal line is a conductor pattern that is
formed on a semiconductor substrate surface via an insulating
10 film.

14. The electromechanical filter according to claim 13,
wherein the signal line is formed over the magnetic
material film pattern to oppose thereto at a predetermined
15 interval.

15. The electromechanical filter according to claim 1,
further comprising:

first and second drive electrodes formed on a substrate
20 surface and constructed to vary a potential;

a conductor pattern arranged to oppose to the first drive
electrode at a predetermined interval and to constitute the
signal line; and

a magnetic field generating portion comprising a
25 magnetic material film pattern that is magnetized to have a

magnetic field component that intersects orthogonally with the signal line,

wherein the signal line is displaced by changing a potential of the first drive electrode,

5 wherein the magnetic material film pattern is displaced by changing a potential of the second drive electrode, and

wherein a ferromagnetic resonance frequency is changed by changing the magnetic field generated by the magnetic material film pattern on the signal line.

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16. The electromechanical filter according to claim 1, further comprising:

a first conductor acting as the signal line;

a magnetic field generating portion for generating the magnetic field passing through the first conductor;

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a drive electrode for varying the magnetic field passing through the signal line by displacing relative positions of the first conductor and the magnetic field generating portion; and

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a second conductor acting as a signal line that transmits an induced electromotive force induced by a resonance between a magnetic field generated by a high-frequency current passing through the first conductor and the magnetic field generated by the magnetic field generating portion.

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17. The electromechanical filter according to claim 16,
wherein the first conductor and the second conductor are
arranged to intersect orthogonally with each other.

5 18. The electromechanical filter according to claim 16,
wherein the first conductor and the second conductor are
arranged in parallel at a predetermined interval.

19. The electromechanical filter according to any one of
10 claims 1 to 18,

wherein a plurality of the electromechanical filters are
aligned and connected to realize a tunable band-pass filter
function.

15 20. The electromechanical filter according to any one of
claims 1 to 18,

wherein a plurality of the electromechanical filters are
aligned and connected to realize a tunable band-stop filter
function.

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